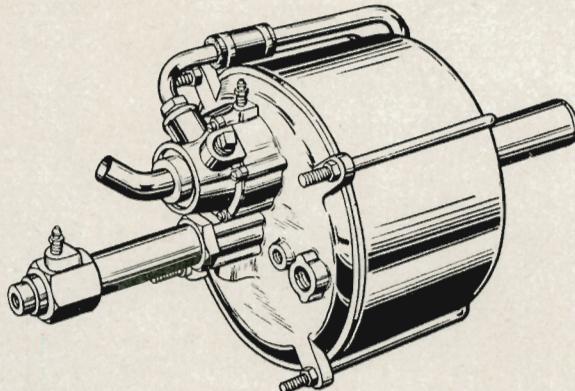


BENDIX VACUUM POWER SERVICE MANUAL

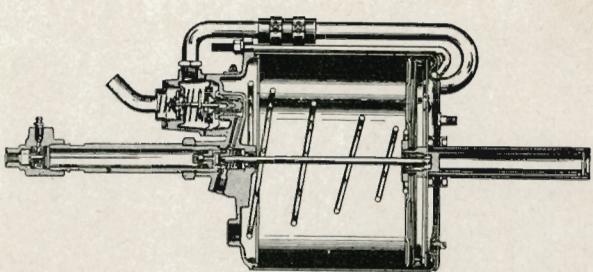
SPECIAL SERVICE INSTRUCTIONS FOR
GUIDED PISTON TYPE MODEL "C" HYDROVACS

DESCRIPTION

The guided piston type of Hydrovac differs from the other Model "C" single piston Hydrovacs in that a separate guide rod guides the vacuum piston throughout its stroke. A self-aligning push rod replaces the rigidly mounted type of push rod used on all other single piston Model "C" Hydrovacs. Illustrated below are two views of the guided piston type of Hydrovacs, showing the external as well as internal construction.



Outside View.



Cutaway View.

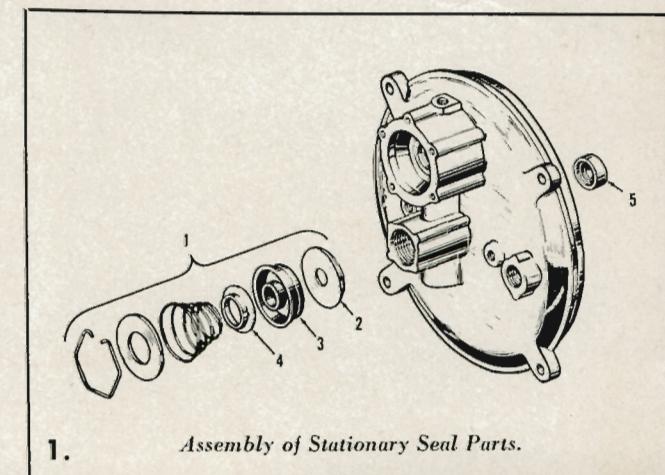
SERVICE PROCEDURE

The following service instructions apply to the guided piston type Model "C" single piston Hydrovacs. Reference to the following illustrations will serve as a guide in the disassembly of the Hydrovac. For more detailed disassembly instructions refer to disassembly of single piston Hydrovacs (pages 3 & 4) of form 9-332B, Bendix Vacuum Power Service Manual No. 4. After disassembly all parts should be thoroughly cleaned. Immersion in Bendix Metalclene Parts Cleaner is recommended for metal parts. Wash all metal parts that come into contact with hydraulic brake fluid in clean alcohol before assembly. Use all parts furnished in the Hydrovac Repair Kit when overhauling the Hydrovac. **DISCARD ALL OLD RUBBER PARTS.** For complete list of service parts and repair kits, see Bendix Parts Catalog No. 9-E, Section II. If the bore of the vacuum cylinder shell is corroded or rusted, polish with fine emery cloth or steel wool; if badly pitted or scored, replace the cylinder shell.

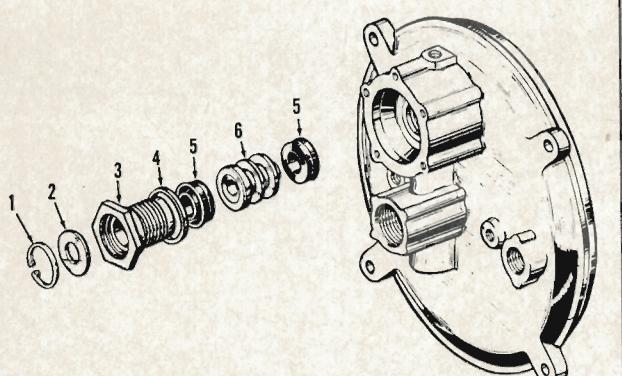
ASSEMBLY INSTRUCTIONS

Following is a step by step procedure covering the assembly of the guided piston type, Model "C" Hydrovac. Use care in handling of hydraulic system parts, to prevent them from coming into contact with mineral oil. Do not handle hydraulic cups or seals with greasy hands.

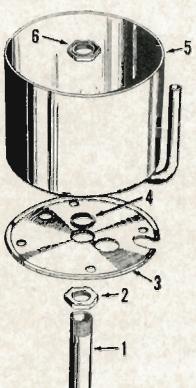
1. Press push-rod leather seal (5) into end plate with lip of leather seal toward hydraulic cylinder side of end plate. Assemble push-rod hydraulic seal parts (1) as illustrated: stop washer (2) with chamfered side as shown; seal cup (3) with lip of cup as shown; retainer washer (4) with flat side next to cup; small end of spring as shown. Place stop washer against the spring and assemble snap ring in groove.



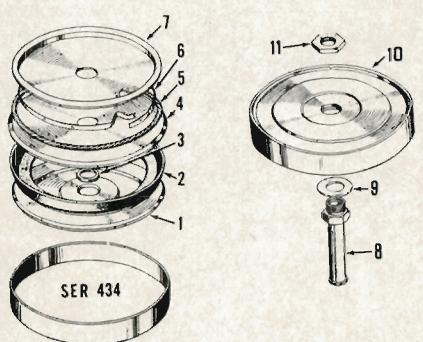
1. Assembly of Stationary Seal Parts.



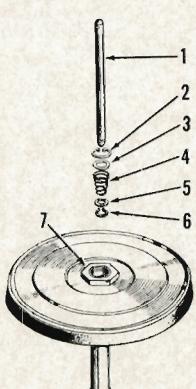
Assembly of Hydraulic Control Valve Piston. 2.



Assembly of Cylinder Shell and Guide Tube. 3.



Assembly of Vacuum Piston and Guide Rod. 4.



Assembly of Push Rod in Guide Rod. 5.

2. Assemble retainer ring (1) and stop washer (2) in fitting (3) using truarc pliers, Tool T-25254. Dip piston cups (5) in brake fluid and assemble on piston (6) as shown. Insert piston and cups into fitting (3) with hole end of piston next to stop washer (2). Place new rubber gasket (4) over threaded end of fitting (3) and thread fitting into end plate and securely tighten fitting with a $1\frac{1}{8}$ " socket.

3. Thread guide tube nut (2) onto guide tube (1) to the limit of the threads. Assemble reinforcing plate (3) and seal (4) over threads of guide tube. Use care so as not to damage the seal. Insert threaded end of guide tube through hole in cylinder shell (5), and thread nut (6) onto guide tube until flush with the end of the guide tube. Stake nut securely in two places and then tighten nut (2) up against the reinforcing plate to insure a good seal between the guide tube and the cylinder shell.

4. If the vacuum piston or guide rod have been disassembled to replace the leather piston packing or other parts, reassemble the piston and guide rod as illustrated. Place assembly ring, SER-434, on bench and assemble vacuum piston parts (1) to (7) in assembly ring, starting with the large diameter piston plate (1) with chamfered side of hole up; leather piston packing (2) with lip of packing up; seal ring (3); and small diameter piston plate (4) with chamfered side of hole down. Cut wicking (5) to required length and assemble against inner face of lip of piston packing; assemble expander ring (6) inside of wicking with gripper points up and notch at loop end of expander ring under clip near opposite end of expander ring; and assemble retainer plate (7) with cut-out portion over loop of expander ring. Hold guide rod (8) in a vertical position and assemble flat washer (9) over threaded end of rod. With assembly ring still in position on vacuum piston, turn vacuum piston and assembly ring (10) upside down and assemble onto guide rod. To prevent damage to the seal ring (3) remove piston plate (1) while guiding seal ring (3) over threads. Replace piston plate and assemble nut (11) onto guide rod. Tighten nut securely and stake nut in two places.

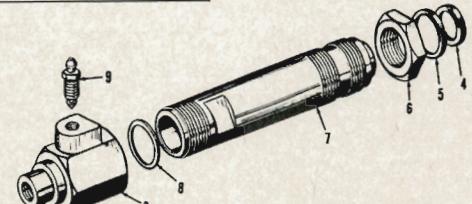
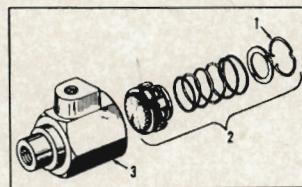
5. Clamp hexagonal section of guide rod firmly in a vise. Assemble push rod attaching parts over beveled end of push rod (1) as shown, starting with larger diameter lockring (2). Use care in assembling smaller diameter lockring (6) in the groove at the lower end of the push rod so as not to distort the lockring. Insert end of push rod in recess at end of guide rod (7). To attach push rod (1) to guide rod (7), compress spring (4) and assemble lockring (2) in groove of guide rod. Use truarc pliers, tool T-25279, when assembling lockring (2). Be sure lockring is firmly seated in the groove of the guide rod.

6. Inspect hydraulic cylinder. If bore is scored, replace cylinder. Assemble check valve parts (2) in end cap (3) as illustrated in inset and assemble lockring (1) in groove of end cap. Be sure lockring is firmly seated in groove. Place new copper gasket (8) in end cap and thread hydraulic cylinder (7) into end cap with milled flats next to end cap, and securely tighten cylinder. Assemble bleed screw (9) in end cap and thread locknut (6) on cylinder to limit of thread. Assemble new hydraulic cylinder locknut seal (5) over end section of thread and place new hydraulic cylinder end seal (4) on shoulder at end of cylinder.

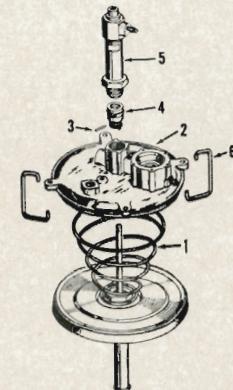
7. Place vacuum piston and guide rod in a vice, clamping on the hex portion of the guide rod. Place vacuum piston return spring (1) over the push rod with the small end of spring next to vacuum piston. Carefully guide push rod through leather seal of end plate (2). Compress spring using hook clamps (6) to hold spring compressed and attach hydraulic piston (4) to push rod by means of retainer pin (3). Slide retainer spring over hole in piston to hold retainer pin in place. Carefully guide hydraulic cylinder (5) over lip of the piston cup and thread hydraulic cylinder into end plate hand tight and then remove hook clamps. Remove from vise and place assembly ring over vacuum piston with the top edge of assembly ring flush with top face of the vacuum piston.

8. Clamp guide tube nut in vise with cylinder shell in vertical position. Insert rubber stopper (1) into control line tube. With top face of vacuum piston flush with top edge of assembly ring, SER-434, line up assembly ring with cylinder shell and guide vacuum piston into cylinder shell. If vacuum piston is permitted to tip slightly, the guide rod will not enter the guide tube. As soon as the guide rod has entered the guide tube, lift the assembly ring to permit inspection of the piston packing. If the leather packing has started to enter the cylinder shell without any part of the packing being folded back, remove rubber stopper and press vacuum piston into cylinder shell approximately two inches, and then replace rubber stopper. If inspection reveals that any part of the piston packing has been folded back, repeat the above operation.

9. With rubber stopper still in the control line tube, slide assembly ring (1) off, over end plate as shown, and then remove rubber stopper from the control line. Assemble new rubber gasket in groove of end plate and align end plate on cylinder shell to scribe marks. Replace hook bolts (2) and tighten uniformly.



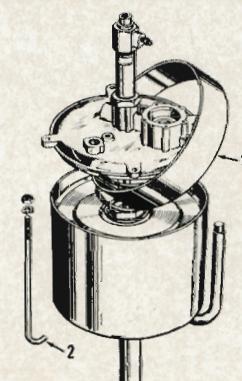
6. Assembly of Hydraulic Cylinder and End Cap.
(Inset shows assembly of Residual Check Valve.)



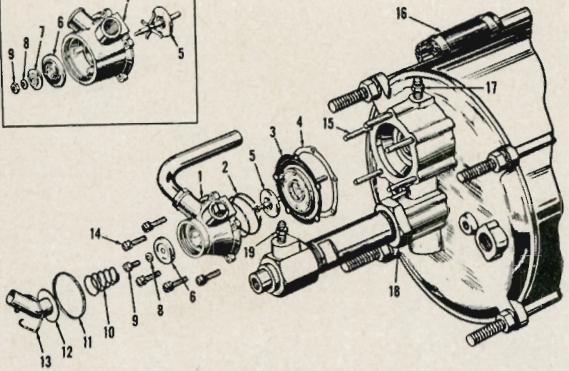
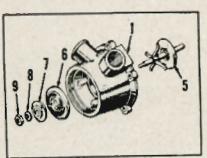
7. Assembly of Vacuum Piston, End Plate and Hydraulic Cylinder.



8. Assembly of Vacuum Piston in Cylinder Shell.



9. Removal of Assembly Ring.



Assembly of Single Atmospheric Poppet Type Control Valve. (Inset shows Double Atmospheric Poppet Type Valve.)

10.

10. Two types of control valves are used. A single atmospheric poppet type valve, and a double atmospheric poppet type valve. Hydrovac 375279 uses the single atmospheric poppet type valve, and Hydrovac 375278 uses the double atmospheric poppet type valve. Assemble poppet valves and related parts (5 through 9) in the control valve housing (1) as illustrated. If assembling Hydrovac 375278, stake nut (9) at two places. The use of guide pins (15) screwed into the end plate will simplify the assembly of spring (2), diaphragm (3), gasket (4) and control valve housing (1) as well as reduce possibility of damaging diaphragm in assembly. Guide pins can be made from No. 8-32 x 2 1/2" machine screws by cutting off the heads. Hold control valve housing and parts against the end plate and remove one guide pin at a time, replacing it with a screw and lockwasher (14).

Assemble vacuum hose (16) in place on control line tubes and tighten hose clamps.

With hydraulic cylinder threaded into end plate hand tight, align bleed screw (19) in end cap with bleed screw (17) in end plate, and then securely tighten locknut (18). NOTE: Do not use a wrench when tightening hydraulic cylinder in end plate.

Inspect to see that all bolts, nuts, washers and screws are in place and securely tightened. After completing Hydrovac overhaul, vacuum and hydraulic leakage and operational tests should be made. For complete test procedure see Test Manual Form No. 9-355.

LUBRICATION



Single Piston with Lubrication Port.

11.

CAUTION: Do not lubricate the Hydrovac until it has been permanently installed on the vehicle. This is a safeguard against lubricating oil entering the hydraulic portion of the Hydrovac which might cause damage to the rubber cups and seals.

The Hydrovac should be lubricated every 10,000 miles or every six months, whichever occurs first, with Bendix Vacuum Cylinder Oil.

To lubricate the Hydrovac remove the 1/8" pipe plug located in the end of the vacuum cylinder shell and inject Bendix Vacuum Cylinder Oil through the fitting up to the point where the oil begins to run out of the port, see Figure 11. Replace and tighten pipe plug.

NOTE: DURING LUBRICATION THE ENGINE SHOULD BE OFF AND HYDROVAC SHOULD BE IN RELEASED POSITION.

SERVICE SALES DEPARTMENT

BENDIX PRODUCTS DIVISION OF

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